



HARBIN ENGINEERING, P.C.

CIVIL & ENVIRONMENTAL CONSULTANTS

J. Steven Harbin, P.E.
President

G. Curtis Reynolds, P.E.
Vice President

December 11, 2019

Ms. Karen Hays
Chief, Air Protection Branch
Environmental Protection Division
Georgia Department of Natural Resources
4244 International Parkway, Suite 120
Atlanta, Georgia 30354

**Subject: Proposed Gasification Project
 Synergy Solutions Crisp County, LP
 Crisp County, Georgia
 H.E. Project No. 7860-010-010**

Dear Ms. Hays:

On behalf of our client and 2018 E3 Award Winner Synergy Solutions Crisp County, LP, Harbin Engineering, PC is requesting that the Division review the attached determinations from U.S. EPA regarding the Coaltec gasification/oxidation unit (Attachments 1 and 2). You may recall from both prior communications and our April 2018 meeting that Synergy Solutions has installed a similar unit in Cordele. While the Cordele facility is currently permitted to utilize only clean cellulosic biomass as a fuel source (and has not yet begun doing so), Synergy Solutions' ultimate goal is to utilize highly processed municipal solid waste (MSW) in the Coaltec unit. However, U.S. EPA has previously provided guidance to EPD (see Attachment 3) that the Coaltec unit, if using processed MSW for fuel as proposed for the Cordele site, would be regulated as a solid waste combustion unit under Clean Air Act (CAA) Section 129, specifically as a "pyrolysis/combustion unit" under the small municipal solid waste incinerator (SMSWI) new source performance standards at 40 CFR 60 Subpart AAAA. U.S. EPA's guidance rested substantially on the conclusion that the thermal oxidizer in the Coaltec unit is close-coupled to the gasifier rather than located some distance away. In addition, EPA's guidance required classifying the Coaltec unit as a pyrolysis unit and relied on a determination from 40 CFR Subpart Eb (large combustors) which is not directly applicable to this situation. We provided more detailed information about the proposed operation and expressed some of our concerns regarding the original guidance both in a February 26, 2018 letter to U.S. EPA (Attachment 4) and in our April 2018 meeting, but there was no change in either agency's position at that time.

In light of that guidance and the results of our April 2018 meeting, Synergy Solutions has continued to improve its proprietary design and to collect data to support a Non-Hazardous Secondary Materials (NHSM) determination which could allow the facility to operate the Coaltec unit using highly processed MSW as a fuel source while avoiding the CAA Section 129 standards. During this time, the attached determination that the Coaltec unit is a gasification unit not a combustion unit from Region 3 (Attachment 1) was made available to us. With the exception of the source of the fuel, the circumstances and equipment reviewed in the Region 3 letter are nearly identical to those proposed for Cordele. The exact same Coaltec unit in Cordele will be gasifying

highly processed solid waste and the resulting syngas will be combusted in a close-coupled oxidizer. However, Region 3 concluded that the Coaltec unit was not subject to the CAA Section 129 solid waste incinerator rules, despite the resulting syngas being combusted in the close-coupled oxidizer. We do understand that the Region 3 unit, by nothing other than the nature of the source of the solid waste being used as fuel, was being evaluated for applicability to the Commercial Industrial Solid Waste Incinerator (CISWI) rules rather than the SMSWI rules. However, by any logic, the situations are *highly* analogous. Since EPA relied on definitions and determinations related to pyrolysis units and large solid waste combustors in their review of the proposed Cordele gasification unit, we wondered if this R3 situation and determination regarding the exact same piece of equipment aren't more directly relevant to the situation and intent of the rules.

Additionally, Synergy Solutions is considering a modification to their design wherein a boiler is not included in the process. In this scenario, the produced syngas would simply be combusted in the oxidizer, which would function as an air pollution control device. The primary objective of the system in this mode would be production of valuable biochar and providing an alternative to landfilling the MSW. EPA has determined similar setups (see Attachment 2) are not subject to CAA Section 129.

We strongly believe in the process and technology Synergy Solutions is proposing. During our April 2018 meeting, both EPD and U.S. EPA conveyed general support for the system's anticipated environmental benefits, but expressed a level of frustration that a design technicality and past determinations, rather than emissions or environmental impacts, made the unit subject to a rule that essentially renders it economically infeasible. It is our hope that these analogous EPA determination letters provide an avenue that would allow U.S. EPA to reconsider the prior guidance for the Cordele unit, which in our view is based on a somewhat arbitrary logic. As such, we request EPD review the attached letters, discuss the issue with U.S. EPA as needed, and provide a written response.

We appreciate the Division's assistance and guidance on this project. We look forward to working with the Division on permitting this promising technology so that the citizens of Central and South Georgia can enjoy its environmental benefits. If you have any questions regarding this request, please contact Jim Christiansen from Carlson Environmental Consultants, PC at 321-704-4162.

Sincerely,
HARBIN ENGINEERING, P.C.



J. Steven Harbin, P.E.
President



Jim Christiansen
Carlson Environmental Consultants, P.C.

ATTACHMENTS

cc: Matt Piell, CEO, Synergy Solutions Crisp County, LP

ATTACHMENTS



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

AUG 17 2017

Mr. Mike McGolden, President
Coaltec Energy USA, Inc.
5749 Coal Drive
Carterville, Illinois 62918

Dear Mr. McGolden:

On October 11, 2016, Coaltec Energy USA, Inc. (Coaltec) sent an email to the U.S. Environmental Protection Agency Region III (EPA), requesting guidance about the Clean Air Act (CAA) regulatory requirements for Coaltec to install gasification/oxidizing systems in Pennsylvania and on the eastern shore of the Chesapeake Bay in Maryland. You proposed your system for processing poultry litter should not be considered a solid waste incinerator under the Clean Air Act Section 129 because the units are gasification units, not combustion unit (Clean Air Act Section 129 provides the statutory authority for EPA to develop regulations for solid waste combustion.)

In the December letter you provided the following details about the process: Coaltec plans to gasify poultry litter and mushroom substrate (depending on the location of the constructed unit) to produce biochar. Most of the as-delivered poultry litter, with an average of 30% moisture, is augered directly into each highly-automated, fixed-bed, refractory-lined, oxygen-starved gasifier at a rate of approximately 5,000 pounds per hour, 24 hours per day, 7 days per week. The litter is augered through the full length of the gasifier over a 2-hour period, with drying and syngas generation taking place in the upper section of the gasifier. The temperature in the upper stage of the oxygen-starved gasifier is approximately 900°F. The red-hot, carbon-rich material drops over a wall into the lower section of the gasifier, where super-heated steam is carefully added in the reaction zone. The temperature in the steam-activation region of the gasifier is approximately 1400° F. The granular, steam- activated carbon is augered through the lower section of the gasifier, where it begins to cool. It is then augered sideways out of the gasifier at 900 to 1,000 pounds per hour, where a light mist of clean water is sprayed on the activated carbon to further reduce the temperature. The conditions inside the gasifier are monitored by thermocouplers, oxygen-probes, and other sensors. The data from these sensors are read by a proprietary algorithm, and the PLC system assures that the oxygen-starved conditions inside the gasifier are properly maintained. The syngas, which results from the gasification process, is routed to a thermal oxidizer for destruction. During the gasification process, ambient air is carefully added to the thermal oxidizer to reduce and oxidize the syngas and also to produce as much waste heat as possible for drying additional poultry litter, produce pathogen-free poultry bedding and to generate waste heat and steam for use by the adjacent feed mill. The temperature in the thermal oxidizer is approximately 1800°F.

Our understanding of your system is that the system is tightly controlled through the use of program local controllers to ensure oxygen starved conditions and temperatures which preclude the



combustion of the poultry litter or mushroom substrate. If so, the gasifier would not be subject to CAA 129 standards for commercial/industrial solid waste incinerators (CISWI) because the gasifier will not be combusting solid waste. *This guidance is based on the information provided by you and could be subject to change if your process deviates from the description provided to EPA. We also note that this is guidance to you, as the manufacturer of the unit and does not provide a determination of applicability for a site specific application to a source which may purchase, install and operate the unit.*

We recognize that the resultant syngas is combusted in the thermal oxidizer in the process you described. The CISWI rule only applies to the combustion of waste gases that are in a container when the container is combusted (see §60.2265). Since the resultant syngas will not be in a container when combusted in the thermal oxidizer, CISWI will not apply to the thermal oxidizer.

We also note that you discussed potential applicability to the Non-Hazardous Secondary Materials (NHSM) Rule with EPA. This rule clarifies what is/is not a solid waste that would be subject to 129 standards if combusted. Furthermore, because the syngas is not a contained gas under CISWI and CISWI does not apply, it is not necessary to evaluate the syngas under NSHM.

Sincerely,



Cristina Fernandez, Director
Air Protection Division

cc: Peter Thomas – Coaltec Energy USA, Inc.



ATTACHMENT 2

March 30, 2010

Patrick D. Traylor
Hogan and Hartson, LLP
Columbia Square
555 Thirteenth Street, NW
Washington, DC 20004

Re: Request for Applicability Determination under 40 C.F.R. Part 60, Subpart AAAA
New Source Performance Standards (“NSPS”) for New Small Municipal Waste
Combustion Units

Dear Mr. Traylor:

We have received your January 8, 2010 request on behalf of Fulcrum BioEnergy, Inc. (“Fulcrum”) for an applicability determination under 40 CFR Part 60, Subpart AAAA – New Source Performance Standards for New Small Municipal Waste Combustion Units (“Subpart AAAA”). We understand that your request is regarding Fulcrum’s proposed facility in McCarran, Nevada, which intends to convert post-sorted municipal solid waste feedstock into a synthetic gas that will be processed to produce ethanol and renewable power. Based on the information that you have provided, we have determined that Subpart AAAA would not apply to Fulcrum’s syngas generation units or the air pollution control flare. Additionally, if Fulcrum’s facility meets the requirements for a small power production facility or a cogeneration facility, then Subpart AAAA would not apply to the combined cycle combustion turbine. Our determinations are explained in further detail below.

Please note that you have requested EPA to make a determination on whether a particular federal regulation applies to a facility that is not yet constructed. As such, our decision in this matter is based solely on the information you provided, both electronically and verbally. If any of the referenced information changes or is no longer accurate, our determination of non-applicability may no longer apply and a new review would be required. Based on the information you have provided to date, our determinations are as follows:

Subpart AAAA does not apply to the syngas gasification process.

We concur with your explanation that Fulcrum's syngas gasification process is neither combustion nor pyrolysis. As a result, the syngas generation unit would not be considered a "pyrolysis/combustion unit" or "municipal waste combustion unit" as defined in Subpart AAAA.

Subpart AAAA would not apply to the combined cycle combustion turbine if the facility meets the requirements for the small power production facility exemption or the cogeneration facility exemption.

40 CFR 60.1020(b) and (c) list the requirements that a facility must meet to qualify for an exemption from Subpart AAAA as a small power production facility or cogeneration facility. Those requirements include meeting criteria established by the Federal Power Act, combusting homogeneous waste, and providing notification and documentation to EPA. We concur with your assessment that the gasified waste would be considered homogeneous. The facility would also need to provide appropriate notification and documentation that it meets the criteria established by the Federal Power Act to qualify for either of these exemptions.

Subpart AAAA would not apply to the air pollution control flare.

We concur with your assessment that the flare would be considered air pollution control equipment and therefore would be excluded from the definition of "municipal waste combustion unit" as defined in Subpart AAAA. This exclusion would apply as long as the flare is operated solely as an air pollution control device.

If you have further questions regarding this determination, please contact Tünde Wang of my staff at (415) 972-3990.

Sincerely,

Douglas K. McDaniel
Chief, Enforcement Office
Air Division

cc: Randy Phillips, NDEP



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

1 SEP 12 2016

Mr. James A. Eason
Unit Manager, NOx Permitting Unit
Stationary Source Permitting Program
Georgia Environmental Protection Division
Air Protection Branch
4244 International Parkway, Suite 120
Atlanta, Georgia 30354

Dear Mr. Eason:

This letter is in response to your June 21, 2016, request for guidance concerning the applicability of 40 CFR Part 60, Subpart AAAAA – (Standards of Performance for Small Municipal Waste Combustion Units) for the Synergy Solutions Crisp County, LP (Synergy Solutions) facility to be located in Cordele, Crisp County, Georgia. Municipal waste combustion units, for which construction occurs after August 30, 1999, and with a municipal solid waste (MSW) combustion capacity of at least 35 tons per day but no more than 250 tons per day of MSW, are regulated by Subpart AAAAA. While this is not a determination of applicability by the EPA for Synergy Solutions, based on our review of the information you have provided, we believe that a gasifier and thermal oxidizer of the type described would be a pyrolysis/combustion unit which is a municipal waste combustion unit according to §60.1465. We hope that the guidance provided in this letter is sufficient for you to make your own determination of applicability for Synergy Solutions. In the permit application received by the Georgia Environmental Protection Division (GA EPD) on October 16, 2015, Synergy Solutions estimates the MSW will be fed to the gasifier at a rate of 120 tons per day and the resultant syngas will be fed to the thermal oxidizer at a rate of 1.06 tons per hour (25.44 tons per day). For the reasons discussed below, we believe that the feed to the gasifier is the appropriate feed rate to use to determine if the unit meets the capacity thresholds of the rule. Application of the rule will ensure the stringent control of emissions of dioxin/furans, metals, including mercury and lead, and acid gases from the system. The materials separation and siting plans and requisite public hearings will give the public an opportunity to work with the facility and to understand the impacts to their community. Operator training will ensure that qualified operators are on site to operate the unit using good pollution control practices and in compliance with the emissions standards in the rule.

As described in your letter, the proposed facility would accept MSW at a rate of up to 360 tons per day, process the MSW through a "fiberizer" to remove what they term "biomass," and sort the remaining solid waste on site to remove metals and other non-organics. The biomass would be gasified at a rate of 120 tons per day in a low-oxygen cross flow unit where the organics are transformed to biochar and syngas. Startup heat would be provided from two 2 million Btu per hour direct fired liquefied petroleum gas burners inside the unit. Our understanding is that these burners do not contact the biomass inside of the gasifier and are turned off once the process reaches steady state. The syngas is immediately

combusted in an adjacent chamber (i.e., thermal oxidizer) to produce heat. Fifty percent of the heat from the thermal oxidizer would be returned to the process for drying of biomass prior to gasification. The remaining 50 percent of the heat from the thermal oxidizer would be sent to a waste heat boiler to generate a portion of the steam used in an unrelated ethanol recovery process, or it will be vented from a stack. The permit application received by the GA EPD on October 16, 2015, indicates the thermal oxidizer will combust an estimated 1.06 tons per hour (25.44 tons per day) of syngas. The syngas would not be filtered, processed, or cleaned prior to combustion and would flow directly from the gasifier to the thermal oxidizer. The biochar is described as the intended finished product that can be sold into established commercial markets, although the specific markets with which Synergy Solutions will contract have not been identified.

Synergy Solutions has also put forth an argument that the separated biomass material is derived from MSW, but is not MSW itself and has been processed out of being MSW prior to being fed to the gasifier. While the Non-Hazardous Secondary Material (NHSM) standards in 40 CFR Part 241 do allow materials that are processed and meet legitimacy criteria to be considered “non-waste” fuels or ingredient products, we do not believe the biomass material would meet those standards. Specifically, processing is defined in 40 CFR 241.2 as operations that transform discarded NHSM into a non-waste fuel or non-waste ingredient, including operations necessary to: remove or destroy contaminants, significantly improve the fuel characteristics (e.g., sizing or drying of the material, in combination with other operations), chemically improve the as-fired energy content, or improve the ingredient characteristics. Minimal operations that result only in modifying the size of the material by shredding do not constitute processing for the purposes of the definition. In the process described in your letter, biomass is separated from the MSW and is dried and heated but does not undergo further processing (we did not evaluate whether the processed material would meet legitimacy criteria under Part 241). Therefore, we would not consider the biomass to be “transformed” into a non-waste fuel, and the biomass entering the gasifier would still be considered MSW.

As indicated in §60.1010 of Subpart AAAA, the standard applies to new municipal waste combustion units that have the capacity to combust at least 35 tons per day but no more than 250 tons per day of MSW or refuse-derived fuel. A “municipal waste combustion unit” is defined in §60.1465 as “**any setting or equipment** that combusts solid, liquid, **or gasified** municipal solid waste.” (Emphasis added).

Based on our review of the information you have provided and the teleconference that we held between the EPA Region 4, GA EPD, and Synergy Solutions on July 26, 2016, we believe that the GA EPD should evaluate the proposed gasifier and thermal oxidizer as a pyrolysis/combustion unit. NSPS Subpart AAAA applies to municipal waste combustion units, which are defined in §60.1465 to include, among other things, pyrolysis/combustion units (except for pyrolysis/combustion units located at a plastics or rubber recycling unit as specified in §60.1020(h)). A “pyrolysis/combustion unit” is defined in §60.1465 as - “a unit that produces gases, liquids, or solids by heating municipal solid waste. The gases, liquids, or solids produced are combusted and the emissions vented to the atmosphere.” While the rulemaking record for NSPS AAAA doesn’t have additional detail on the inclusion of pyrolysis, the rulemaking record for Large Municipal Waste Combustors, NSPS Eb, does have such a discussion¹:

¹ The definition of pyrolysis/combustion unit is the same in NSPS AAAA and NSPS Eb and the definition of municipal waste combustor/combustion unit is substantively the same in NSPS AAAA and NSPS Eb. Therefore, we believe it is reasonable to rely on the rulemaking record for NSPS Eb for additional clarity on the terms as there is no discussion in NSPS AAAA to the contrary.

An MWC is defined as setting or equipment that combusts MSW including air curtain incinerators. **Municipal solid waste combustion includes the direct combustion of MSW or the combustion of MSW gases from pyrolysis or gasification.** The MWC unit includes any type of setting or equipment including combustion equipment with or without heat recovery. [Emphasis added] 60 FR 65391

Based on this definition and the clause “any type of setting or equipment” a pyrolysis/combustion unit could consist of one piece of equipment and could also consist of more than one piece of equipment and can include the combustion of gases, liquids or solids produced from pyrolysis or gasification. The EPA believes the determination of whether a the pyrolysis/combustion unit is one piece of equipment or more than one piece of equipment, or is a pyrolysis/combustion unit or two separate units (i.e., a pyrolysis unit and a separate combustion unit) is determined based on site specific facts, including, but not limited to the design of the pyrolysis and combustion chambers, the proximity of the pyrolysis and combustion chamber to one another, the presence (or absence) of “cleaning” steps (e.g., scrubber or cyclone) or processing steps (e.g., distillation) between the pyrolysis chamber and the combustion chamber and whether the operation of the steps are integral to one another. As gasification by itself is not combustion and cleaning or processing steps allow for “off-ramps” where the resultant syngas may be evaluated as a waste or non-waste for NHSM, we believe such steps provide a boundary between the gasifier and the combustion unit such that they are not pyrolysis/combustion units but should be evaluated as separate units.

As you point out in your letter, two letters on similar subjects are found on the EPA Applicability Determination Index (ADI) - a March 30, 2010, response (ADI control no. 1000019) from the EPA Region 9 to the Fulcrum BioEnergy, Inc. facility in McCarran, Nevada and a September 7, 2010, response (ADI control no. 1500025) from the EPA Region 10 to Washington Department of Ecology concerning the Green Power, Inc. facility in Pasco, Washington². (See Enclosures.) Both of these letters relate to site-specific issues for systems that differ from the proposed MWC unit at Synergy Solutions, as discussed below.

Our understanding of the record for the Fulcrum BioEnergy facility is that there was no combustion associated with the gasifier, prior to routing to the turbine. The EPA Region 9 determined that the syngas gasification system, producing syngas which would be processed to produce ethanol and renewable power, was neither combustion nor pyrolysis and therefore would not be a “pyrolysis/combustion” unit. The second part of the determination implies that the combustion of the gasified municipal solid waste generated in the syngas gasification system in the combined cycle combustion turbine would be subject to NSPS AAAA, except for the fact that the facility may be able to qualify for the small power production facility or cogeneration exemption at §60.1020(b) or (c).

The guidance letter from the EPA Region 10 to Washington Department of Ecology concerning Green Power indicates the process whereby non-condensable gases (NCG) derived from MSW in a “catalytic pressure-less de-polymerization (CDP)” process are “gasified municipal solid waste” and when combusted in a gas combustion turbine, would be subject to NSPS AAAA. The letter does not specifically address the CDP process in which the gasified MSW is produced, as the question of

² The letter from EPA R9 to Fulcrum is an applicability determination as it is issued from EPA to the source. The EPA letter to Region 10 concerning Green Power is guidance to the state, to make their own determination of applicability.

applicability had to do the gas combustion turbine. It does reference a process configuration described by Green Power in their Notice of Construction (NOC), dated February 11, 2008. According to the NOC, the CDP is a synthetic fuel production facility, with raw material handling, the CDP process, liquids storage tanks, a liquid loading rack, and a gas-fired turbine. According to the process description, the gasification process is separated from the combustion process by additional processing steps. As described in the NOC, the CDP produces vapors which are routed to a distillation column, where the liquid products are separated and subsequently stored and sold. The non-condensable vent stream from the distillation column, after passing through two condensers, is routed to the gas combustion turbine, where combustion occurs. For this reason, Region 10 considered the CDP process to be separate from the MWC, which is the turbine burning gasified MSW, and used the input to the gas turbine to determine the capacity of the municipal waste combustor.

To determine the capacity of the Synergy Solutions process, we asked for additional information during the above referenced July 26th conference call. In an email of July 28, 2016, to Marcia Mia of the Office of Compliance at EPA, Synergy Solutions provided additional detail regarding the flow of gases from the gasifier to the thermal oxidizer. According to that attachment, the movement of the gases go in opposite direction from the biomass, and is pulled from the reaction zone of the gasifier through the upper section above the "biomass" and through the roof of the gasifier which is coupled to the thermal oxidizer. Downstream (e.g., toward the thermal oxidizer) there is an air ring where air is added to convert the syngas, which is predominately carbon monoxide, into carbon dioxide. Upon introduction into the combustion zone of the thermal oxidizer, combustion of the syngas occurs. The hot gases from the thermal oxidizer are used for heat recovery in the "biomass" dryer and a process heater in another process (i.e., ethanol plant process boiler). Synergy Solutions states that the thermal oxidizer is operated continuously with the gasifier and the gasifier system cannot operate without the thermal oxidizer supplying heat to the dryer. Because the gasifier is coupled directly to the thermal oxidizer, with no clean-up or processing in between, we believe that this would make the gasifier and the thermal oxidizer one unit and would constitute the pyrolysis/combustion unit. The waste heat recovery to the process dryer and the ethanol plant process boiler does not alter this. In fact, the definition of "municipal waste combustion unit" at 60.1465, in relevant part, includes the heat recovery equipment:

The municipal waste combustion unit boundary starts at the municipal solid waste pit or hopper and extends through three areas:

- (i) The combustion unit flue gas system, which ends immediately after the heat recovery equipment or, if there is no heat recovery equipment, immediately after the combustion chamber.

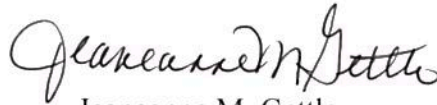
For this reason, the capacity for the purposes of applicability to NSPS AAAA would be based on the feed rate to the MWC which starts at the solid waste pit or hopper to the gasifier, or 120 tons per day. This is within the capacity of MSW combustors covered by NSPS AAAA.

Also during our conference call with Synergy Solutions and the GA EDP, Daryl Himes of our RCRA Compliance Section, provided some guidance on the regulatory status of biochar and the potential generation of any ash or baghouse waste resulting from the combustion of MSW. Please note that during the conference call, representatives of Synergy Solutions stated that the operations to be performed at the facility would not result in the generation of any air particulate, namely ash or any baghouse waste,

which would be captured within an air pollution control device. Such a material, if generated, would be considered to be a "sludge" as defined at 40 CFR § 260.10 and a solid waste as defined 40 CFR § 261.2. As such, any such material would require that a hazardous waste determination be performed in accordance with 40 CFR § 262.11 before transporting the material off-site for disposal. As for the biochar, facility representatives stated that use of the material upon its production would include placement onto the ground. Such placement, pursuant to 40 CFR § 261.2 would be considered as use constituting disposal. Therefore, adequate testing of the biochar in accordance with the requirements of 40 CFR § 262.11 would also be necessary for the toxicity characteristic leaching procedure constituents listed at 40 CFR § 261.24 before this material is shipped off-site for this purpose.

The guidance provided in this letter has been coordinated with the EPA's Office of Enforcement and Compliance Assurance, the Office of General Counsel, the Office of Air Quality Planning and Standards, and the Office of Land and Emergency Management. If you have any questions concerning this letter, please contact Todd Russo at (404) 562-9194.

Sincerely,

A handwritten signature in black ink, appearing to read "Jeaneanne M. Gettle". The signature is fluid and cursive, with the first name being the most prominent.

Jeaneanne M. Gettle
Acting Director
Air, Pesticides and Toxics Management Division

Enclosures

cc: Charlene Spells, OAQPS
Rick Vetter, OGC
Marcia Mia, OECA
George Faison, OLEM
David Langston, Region 4, RCRD
Daryl Himes, Region 4, RCRD

March 30, 2010

Patrick D. Traylor
Hogan and Hartson, LLP
Columbia Square
555 Thirteenth Street, NW
Washington, DC 20004

Re: Request for Applicability Determination under 40 C.F.R. Part 60, Subpart AAAA
New Source Performance Standards ("NSPS") for New Small Municipal Waste
Combustion Units

Dear Mr. Traylor:

We have received your January 8, 2010 request on behalf of Fulcrum BioEnergy, Inc. ("Fulcrum") for an applicability determination under 40 CFR Part 60, Subpart AAAA – New Source Performance Standards for New Small Municipal Waste Combustion Units ("Subpart AAAA"). We understand that your request is regarding Fulcrum's proposed facility in McCarran, Nevada, which intends to convert post-sorted municipal solid waste feedstock into a synthetic gas that will be processed to produce ethanol and renewable power. Based on the information that you have provided, we have determined that Subpart AAAA would not apply to Fulcrum's syngas generation units or the air pollution control flare. Additionally, if Fulcrum's facility meets the requirements for a small power production facility or a cogeneration facility, then Subpart AAAA would not apply to the combined cycle combustion turbine. Our determinations are explained in further detail below.

Please note that you have requested EPA to make a determination on whether a particular federal regulation applies to a facility that is not yet constructed. As such, our decision in this matter is based solely on the information you provided, both electronically and verbally. If any of the referenced information changes or is no longer accurate, our determination of non-applicability may no longer apply and a new review would be required. Based on the information you have provided to date, our determinations are as follows:

Subpart AAAAA does not apply to the syngas gasification process.

We concur with your explanation that Fulcrum's syngas gasification process is neither combustion nor pyrolysis. As a result, the syngas generation unit would not be considered a "pyrolysis/combustion unit" or "municipal waste combustion unit" as defined in Subpart AAAAA.

Subpart AAAAA would not apply to the combined cycle combustion turbine if the facility meets the requirements for the small power production facility exemption or the cogeneration facility exemption.

40 CFR 60.1020(b) and (c) list the requirements that a facility must meet to qualify for an exemption from Subpart AAAAA as a small power production facility or cogeneration facility. Those requirements include meeting criteria established by the Federal Power Act, combusting homogeneous waste, and providing notification and documentation to EPA. We concur with your assessment that the gasified waste would be considered homogeneous. The facility would also need to provide appropriate notification and documentation that it meets the criteria established by the Federal Power Act to qualify for either of these exemptions.

Subpart AAAAA would not apply to the air pollution control flare.

We concur with your assessment that the flare would be considered air pollution control equipment and therefore would be excluded from the definition of "municipal waste combustion unit" as defined in Subpart AAAAA. This exclusion would apply as long as the flare is operated solely as an air pollution control device.

If you have further questions regarding this determination, please contact Tünde Wang of my staff at (415) 972-3990.

Sincerely,

Douglas K. McDaniel
Chief, Enforcement Office
Air Division

cc: Randy Phillips, NDEP



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

SEP 07 2008

OFFICE OF
AIR, WASTE AND TOXICS

Karen K. Wood
Eastern Regional Office
State of Washington Department of Ecology
4601 N. Monroe St.
Spokane, Washington 99205-1295

Margaret A. Yowell
Foster Pepper PLLC
1111 Third Avenue, Suite 3400
Seattle, Washington 98101-3299

Re: Applicability of 40 C.F.R. § 60 Subpart AAAA to the Green Power, Inc., Facility in
Pasco, Washington

Dear Ms. Wood and Ms. Yowell:

This letter responds to inquiries from the Washington Department of Ecology (Ecology) and Green Power, Inc., (Green Power) regarding the applicability of the New Source Performance Standards for Small Municipal Waste Combustion Units (40 C.F.R. § 60 Subpart AAAA) to the Green Power facility in Pasco, Washington. Ecology requested a determination of the applicability of Subpart AAAA to the facility process configuration described in Green Power's February 11, 2008, Notice of Construction (NOC) application. Green Power, through its counsel Foster Pepper, PLLC, requested an applicability determination with respect to the same configuration that is the subject of Ecology's request, as well as various alternative process scenarios.¹

Green Power describes its process in the NOC and Amended NOC as a proprietary catalytic pressure-less depolymerization process (CDP) which according to Green Power can convert municipal solid waste or a wide variety of organic wastes into synthetic liquid petroleum fuel which includes a small amount of non-condensable hydrocarbon gases. According to the February 11, 2008, NOC, the non-condensable hydrocarbon gas portion of the synthetic fuel is combusted in a turbine to generate power for the operation of the process. EPA has determined the Green Power process described in the February 11, 2008, NOC would be subject to Subpart AAAA due to the combustion of non-condensable hydrocarbon gases derived from waste in a gas combustion turbine. However, as explained further below, under an alternative process

¹ The alternative operating and process scenarios that are the subject of Green Power's request for an applicability determination are detailed in Green Power's Amended Notice of Construction (Amended NOC) dated June 27, 2008 and in Green Power's Response to Motion for Summary Judgment.

scenario which does not involve combustion, the CDP unit, as described by Green Power, would not be subject to Subpart AAAA.

Subpart AAAA Applicability to the Gas Combustion Turbine

A municipal waste combustion unit is subject to the requirements of Subpart AAAA if:

- (a) the municipal waste combustion unit is a new municipal waste combustion unit; and
- (b) the municipal waste combustion unit has the capacity to combust at least 35 tons per day but no more than 250 tons per day of municipal solid waste or refuse-derived fuel.

40 C.F.R. § 60.1015 defines a “new” municipal waste combustion unit as a unit that commences construction after Aug 30, 1999, or one that commenced reconstruction or modification after June 6, 2001. A municipal waste combustion unit (MWC) is defined at 40 C.F.R. § 60.1465 as “*any setting or equipment that combusts solid, liquid, or gasified municipal solid waste (MSW)*” (emphasis added). The definition goes on to state that a MWC includes all equipment within specified boundaries. The boundaries start at the municipal solid waste pit and extend through a number of discharge points including the combustion flue gas system. The combustion unit flue gas system ends immediately following the combustion chamber if there is no heat recovery equipment.

Applying this definition to the process configuration described in the Green Power NOC dated February 11, 2008, it is apparent that the MWC unit includes in part equipment in which combustion of MSW occurs. The power turbine section and electrical generator set (also commonly referred to as a turbine-generator set) are not part of the Green Power MWC. However, the compressor section and combustor section of the turbine at the Green Power facility are within the MWC boundaries. In the operation of a combustion turbine fueled with gasified MSW, the compressor section and combustor section together are used to create compressed combustion gases that are supplied to the power turbine section which expands the combustion gases (extracting energy) in the rotating blades of the power turbine which drives the generator set. Therefore, the compressor section and combustor section of the turbine are part of the MWC. The regulatory definition of a MWC specifically excludes turbines that combust landfill gases; however, the Green Power operation does not combust landfill gases and the landfill gas exemption, therefore, is not applicable.

Green Power specifically requested that EPA evaluate whether the MWC is subject to Subpart AAAA due to its combustion capacity. If a MWC has a combustion capacity of at least 35 tons per day but no more than 250 tons per day of municipal solid waste or refuse-derived fuel, it is subject to Subpart AAAA.² Applicability of Subpart AAAA is based on the

² If the MWC’s combustion capacity is less than 35 tons per day, applicability of 40 C.F.R. Part 60 Subpart EEEE (Standards of Performance for Other Solid Waste Incinerators) or 40 C.F.R. Part 60 Subpart CCCC (Standards of Performance for Commercial and Industrial Solid Waste Incineration Units) should be examined. If the capacity is greater than 250 tons per day, the

combustion capacity of the MWC, and would not include the capacity attributable to the flare since the flare is being used as a control device.

To determine the combustion capacity of the MWC, it is necessary to determine, based on the turbine's combustion capacity when combusting non-condensable hydrocarbon gases, the equivalent amount of MSW or refuse-derived fuel. EPA has calculated a unit capacity for the combustion turbine of 93 tons of MSW per day based on information provided in the NOC. The NOC states that there is 14,000 BTU per kW for the 2.5 MW and it is represented that this reflects the turbine's maximum combustion capacity³. It must be assumed that was meant to be 14,000 BTU/hr per kW for the units to be correct. Multiplying 2500 kW by 14,000 Btu/hr / kW results in a heat input capacity of 35 MMBtu/hour and applying a heating value of 4, 500 British thermal units per pound of MSW combusted as specified in Subpart AAAA, 40 CFR 60.1460(d)(1)(ii), yields a unit capacity for the combustion turbine of 93 tons of MSW per day, which is within the range for Subpart AAAA applicability.

Subpart AAAA Does Not Apply to the Green Power CDP in the Absence of Combustion at the Plant

Green Power describes its process as a proprietary catalytic pressure-less depolymerization process (CDP) where municipal solid waste or a wide variety of organic wastes are "cracked" at the molecular level and the long-chain polymers (plastics, organic material such as wood, etc.) are chemically altered to become short-chain hydrocarbons with no combustion. Combustion requires oxygen or a similar compound, but according to Green Power the CDP occurs in an anaerobic environment, exposed only to inert gasses like nitrogen. Green Power states that because of the presence of non-condensable hydrocarbon gases in the reactor, allowing oxygen to enter the system could result in an explosion. EPA has determined that if the CDP is as described by Green Power⁴ it would not be subject to Subpart AAAA due to the absence of combustion in the CDP if the plant is constructed such that there is no combustion of the synthetic fuel product.

Subpart AAAA Does Not Apply to the Proposed Flare

Subpart AAAA excludes air pollution control equipment from the boundaries of an MWC unit, pursuant to the definition of a Municipal Waste Combustion Unit found at 40 C.F.R. § 60.1465. Therefore, if Green Power installs a flare that functions as an air pollution control device, the flare would not be considered part of an MWC.

applicability of 40 C.F.R. Part 60 Subpart Eb (Standards of Performance for Large Municipal Waste Combustors) should be examined.

³ Based on information provided in the Notice of Construction Air Permit Application dated February 2008, Appendix B, Table B-2, Footnote 1.

⁴ The description of the process which EPA relied upon to make this determination is found in the "Declaration of Michael Spitzauer in Opposition to Respondent's Motion for Summary Judgment," which was included as an attachment to Green Power's January 25, 2010 request to EPA.

Subpart AAAA does not apply to the Proposed Algae Production Alternative

Green Power has requested that EPA determine the applicability of Subpart AAAA to a proposal whereby the non-condensable hydrocarbon gases produced in the reactor are routed to a biological treatment unit as a nutrient in the production of algae which would subsequently be harvested and reintroduced as a feedstock for the CDP process. EPA has determined that Subpart AAAA would not apply in this situation because no combustion is occurring.

Other Considerations and Exemptions from Subpart AAAA

Subpart AAAA would not apply to a gas combustion turbine if the facility is able to satisfy the requirements for either the small power production facility or the cogeneration facility exemptions found at 40 C.F.R. § 60.1020(b) and (c). In order to avail itself of either of those exemptions, however, Green Power must provide documentation supporting an assertion that the facility qualifies as specified in the regulation, which Green Power has not done to-date. Accordingly, EPA has not evaluated Green Power's eligibility for those exemptions.

If you have any questions about this applicability determination, please contact Heather Valdez of the Region 10 Office of Air, Waste and Toxics at (206) 553-6220.

Sincerely,



Nancy Helm, Manager
Federal and Delegated Air Programs Unit

cc: Kay Shirey, Assistant Attorney General, State of Washington
Gregory Flibbert, WA State Department of Ecology



HARBIN ENGINEERING, P.C.

CIVIL & ENVIRONMENTAL CONSULTANTS

J. Steven Harbin, P.E.
President

G. Curtis Reynolds, P.E.
Michael W. Biers, P.E.

February 26, 2018

Ms. Beverly Banister
Director, Air, Pesticides, and Toxics Management Division
United States Environmental Protection Agency Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303-8960

**Subject: Proposed Gasification/Combustion Project
Synergy Solutions, LLC
Crisp County, Georgia
H.E. Project No. 7860-010-010**

Dear Ms. Banister:

On behalf of our client, Synergy Solutions, LLC, Harbin Engineering, PC is providing this response to a guidance letter which was sent to Mr. James Eason of the Georgia Environmental Protection Division (GEPD), Air Protection Branch, by the Air, Pesticides, and Toxics Management Division (the Division) on September 12, 2016. The letter, provided in Attachment 1, was in response to a request from GEPD seeking guidance on the applicability of 40 CFR Part 60, Subpart AAAA to a proposed gasification/combustion project to be located in Cordele, Crisp County, Georgia. Synergy Solutions appreciates the level of detail and thought that went into the response.

Though some time has passed since the letter was issued, Synergy Solutions remains committed to operating the proposed waste processing and gasification/combustion system, which will take municipal solid waste (MSW), transform it through a series of highly controlled processes to a clean, primarily organic biomass product similar in content and character to compost, gasify the biomass to produce a clean synthesis gas (syngas), then combust the syngas in a thermal oxidizer to produce heat. In addition to the front-end sorting and screening to divert recyclables from the waste stream, the gasifier will produce a high-carbon biochar product that can be used in a variety of applications including air and water treatment. The combustion of the syngas will produce a renewable energy that both provides the heat necessary for gasification as well as eliminate the need for the use of diesel or other fuels in a co-located ethanol production plant. Few systems extract such wide-ranging benefits from the waste stream, including a high-end use of the organic fraction, while limiting potential environmental impacts.

As we have interpreted it, the Division's guidance letter offered three primary lines of reasoning for concluding the proposed unit should be regulated under Subpart AAAA:

1. The Division believed that the proposed gasification/thermal oxidation system should be considered a single pyrolysis/combustion unit which is one of the classifications of municipal waste combustion units as defined in 60.1465. This belief was based primarily on two points. First, that gasification is substantially similar to pyrolysis, and second, that the gasifier was directly coupled to the thermal oxidizer with no “off-ramps” for cleaning or processing the syngas prior to entering the thermal oxidizer, where the only combustion in the system occurs.
2. The Division stated they would not consider the biomass to be sufficiently transformed to render it a non-waste fuel, and as such, the material entering the “pyrolysis/combustion” unit would still be considered MSW.
3. Applicability to the tonnage thresholds found in the various solid waste incinerator rules should be determined by the feed rate to the gasifier, proposed as 120 TPD which is within the range of Subpart AAAA.

The Synergy team has closely reviewed the findings of the letter, which were based upon the information available to the Division at the time. While we agree with some of the conclusions, there are two important aspects we request the Division consider and that we would like to discuss further.

First, we believe it is clear that the intent of the various MSW incinerator rules, including Subpart AAAA, is to regulate the *combustion* of MSW. If there was no combustion in the unit, only gasification, it would not be subject to any incinerator rules. §60.1010(b) of Subpart AAAA explicitly states that applicability is based upon the capacity to **combust** (emphasis added) between 35 and 250 TPD of MSW or refuse derived fuel (RDF). It does not say “process” or “gasify.” In the proposed unit, while the gasifier and thermal oxidizer are indeed closely connected with no off-ramps, combustion occurs only in the thermal oxidizer. The tonnage of materials that flow from the gasifier to the oxidizer can readily be quantified through mass balance. Thus, while the Division has utilized a line of reasoning that relies upon the definitions at §60.1045 to define the applicable tonnage as that fed to the gasifier (120 TPD), we contend the intent of the rule is better met by defining the applicability based on the tonnage of material fed to the thermal oxidizer, which is the only place in the system where combustion occurs. As proposed, the unit will combust approximately 26 TPD of syngas, which would place it below the lower threshold of Subpart AAAA and render the unit *potentially* subject to the Other Solid Waste Incinerator (OSWI) rule at Subpart EEEE. Such an approach avoids inclusion of the biochar produced in the gasifier (which again is never combusted) in the applicability tonnages.

Second, while Synergy Solutions and their consultants provided information suggesting that the system converted MSW to a non-waste fuel, they did not attempt to seek a formal non-hazardous secondary materials (NHSM) determination per 40 CFR 241. We also believe they did not provide sufficient information or detail for U.S. EPA to fairly evaluate if the system meets the both transformation and legitimacy criteria under the Rule, and as such, the conclusion on this aspect was based upon incomplete information. Based upon our assessment, including some changes

that have been made in the proposed waste processing systems, we do indeed believe that a strong case can be made that the waste is both sufficiently transformed and the resulting product is managed as legitimate fuel. While we will not provide details here, we can state that the system provides far more than minimal processing and produces a biomass product that, when tested, met State metals and pathogens standards for use as compost. The syngas, rather than being produced from minimally processed or unprocessed MSW, is instead derived from a highly processed, far cleaner organic fraction of the waste. As such, we intend to prepare and submit such a determination and will be seeking U.S. EPA's guidance in this process.

We have reached out to GEPD and they have graciously offered to organize a joint meeting/call in Atlanta to discuss these matters further. It is our understanding they will contact the appropriate persons in Region 4 to coordinate. We look forward to working with the Agency on this promising technology and we hope that this letter provides sufficient information so that the appropriate persons can be present and prepared to assist us in this process. If you have any questions regarding this response, please contact Jim Christiansen at 321-704-4162.

Sincerely,
HARBIN ENGINEERING, P.C.



J. Steven Harbin, P.E.
President



Jim Christiansen
Carlson Environmental Consultants, P.C.

ATTACHMENT

cc: Karen Hays, Georgia EPD
Matt Piell, Synergy Solutions